

## Patent Claims

1. Method in which a composition of a polymer blend, melt and / or solution used to produce a polymer is monitored, wherein the polymer blend, melt and / or solution is guided through an installation volume during the production and a sample gas that is formed from the polymer blend, melt and / or solution is withdrawn from the installation volume and fed to a mass spectrometer (28), which automatically outputs an analysis signal representing the composition of the sample gas, **characterised in that** the sample gas is guided directly from the installation volume to the mass spectrometer (28) through a gas line (29) connected to the installation volume.
2. Method according to Claim 1, **characterised in that** a transport gas is added to the sample gas in the gas line (29).
3. Method according to Claim 2, **characterised in that** the transport gas (57) is heated.
4. Method according to Claim 2 or 3, **characterised in that** the transport gas (57) is fed under pressure.
5. Method according to one of the preceding claims, **characterised in that** the gas line (29) is heated.
6. Method according to Claim 5, **characterised in that** the gas line (29) is heated to at least the condensation temperature of the sample gas.

7. Method according to Claim 5 or 6, **characterised in that** the gas line (29) is heated to at least 200° C.
8. Method according to Claim 7, **characterised in that** the gas line (29) is heated to at least 290° C.
9. Method according to one of the preceding claims, **characterised in that** the gas line (29) is flushed with a flushing gas (58) after the conveyance of the sample gas.
10. Method according to Claim 9, **characterised in that** the flushing gas (58) is heated.
11. Method according to Claim 10, **characterised in that** the flushing gas (58) is heated to a temperature of at least the condensation temperature of the sample gas.
12. Method according to one of the Claims 9 to 11, **characterised in that** an oxidizing gas is used as the flushing gas (58).
13. Method according to one of the preceding claims, **characterised in that** the sample gas is fed to the mass spectrometer (28) from various sampling sites (30, 31, 32, 33, 34, 35, 36) of the installation volume in an alternating manner.
14. Method according to one of the preceding claims, **characterised in that**, in a manner that allows fluids to be conducted, a multiple number of sampling sites (30 to 36) can each be connected to the mass spectrometer (28) by means of an electronically controlled shut-off device (47, 48).

15. Method according to Claim 14, **characterised in that** the connection of the sampling sites (30 to 36) to the mass spectrometer (28) is generated according to a predetermined adjustable clock.
16. Method according to one of the preceding claims, **characterised in that** the polymer is produced by polycondensation.
17. Method according to one of the preceding claims, **characterised in that** an exhaust vapour of a reactor system (2, 8, 15, 18, 22) is diverted as a sample gas.
18. Method according to one of the preceding claims, **characterised in that** the connection between the installation volume and the gas line (29) is closed when the flushing gas (58) is guided through the gas line.
19. Method according to one of the preceding claims, **characterised in that** the connection between the gas line (29) and the mass spectrometer (28) is interrupted when flushing gas is being guided through the gas line (29).
20. Method according to one of the preceding claims, **characterised in that** at least one reactor system (2, 8, 12, 14, 15, 17, 18, 20, 22, 25) is controlled in dependence on the analysis signal.
21. Automatic analysis device (27) that is arranged in such a way that it can be built into an installation (1) for the production of a polymer from a polymer blend, melt and / or solution that is guided through an installation volume, having at least one gas line (29), said gas line (29) being developed in such a way that it can be connected to the installation

volume in a manner that allows the fluids to be conducted and can be opened and closed automatically, and having at least one mass spectrometer (28) to which a sample gas formed from the polymer blend, melt and / or solution can be fed through the gas line (29) during the production of the polymer, wherein an analysis signal that is representative for the composition of the sample gas can be outputted by the mass spectrometer (28).

22. Automatic analysis device (27) according to Claim 21, **characterised in that** a controller (37) and a shut-off device (47, 48) controlled by a controller are provided, wherein the gas line can be automatically released by the shut-off device (47, 48) depending on an activation signal from the controller (37).
23. Automatic analysis device (27) according to Claim 21 or 22, **characterised by** a pumping apparatus (35), by means of which the sample gas can be conveyed to the mass spectrometer.
24. Automatic analysis device (27) according to one of the Claims 21 to 23, **characterised in that** the gas line (29) is arranged in such a way that it can be shifted into a flushing state by means of being separated from the installation volume and having a flushing gas flow through it.
25. Automatic analysis device (27) according to one of the Claims 21 to 24, **characterised by** a heating apparatus (63), by means of which the gas line (29) can be heated.
26. Automatic analysis device (27) according to one of the Claims 21 to 25, **characterised in that** the multiple number of sampling sites (30 to 36),

distanced from one another, flow into the shut-off device (47, 48), and in that by means of a controller one sampling site (30 to 36) at a time can be connected to the mass spectrometer via the shut-off device (47, 48) in a way that it allows fluids to be conducted.

27. Installation (1) for the production of a polymer, with at least one reactor system (2, 8, 12, 14, 15, 17, 18, 20, 22, 25), **characterised by** an automatic analysis device (27) according to one of the preceding claims.
28. Installation (1) according to Claim 27, **characterised by** a controller (37), by means of which at least one reactor system (2, 8, 12, 14, 15, 17, 18, 20, 22, 25) can be controlled, depending on the analysis signal.
29. Installation (1) according to Claim 27 or 28, **characterised in that** the installation (1) is designed as a polycondensation installation.